

WHAT IS CLAIMED IS:

1. A micro-array system for a micro amount of biomolecules carrying on a bioreaction in a reaction solution, which comprises:
 - a substrate comprising a plurality of micro-wells for receiving the
5 reaction solution;
 - a plurality of micro-beads placing in the reaction solution for the biomolecules attached on surfaces thereof; and
 - a vibrating module for vibrating the substrate, which makes the biomolecules attached on the micro-beads react evenly.
- 10 2. The micro-array system according to Claim 1, wherein the biomolecules are selected from the group consisting of nucleic acids, peptides and carbohydrates.
3. The micro-array system according to Claim 1, wherein the bioreaction is selected from the group consisting of polymerase chain
15 reaction, nucleic acid-nucleic acid hybridization, protein-protein hybridization, and nucleic acid-protein hybridization.
4. The micro-array system according to Claim 1, wherein the substrate is made from silicon.
5. The micro-array system according to Claim 1, wherein the
20 micro-beads are magnetic beads.
6. The micro-array system according to Claim 1, wherein the micro-beads are activated with a coupling agent for the biomolecules immobilized thereon.
7. The micro-array system according to Claim 6, wherein the
25 coupling agent is 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide hydrochloride.

8. The micro-array system according to Claim 1, wherein the vibrating module is set under the substrate.

9. The micro-array system according to Claim 1, wherein the vibrating module comprises an electro-static vibrator.

5 10. The micro-array system according to Claim 1 further comprising a temperature control module for controlling the temperature of the reaction solution.

10 11. The micro-array system according to Claim 10, wherein the temperature control module comprises a temperature sensor, a heater, and a cooler.

12. The micro-array system according to Claim 11, wherein the temperature sensor and the heater are a heating/sensing resistor.

13. The micro-array system according to Claim 1 further comprising a laser source.

15 14. The micro-array system according to Claim 13 further comprising a lens.

15. The micro-array system according to Claim 1 further comprising a cover plate.

20 16. The micro-array system according to Claim 1 further comprising a signal sensor.

17. A method for a micro amount of biomolecules carrying on a bioreaction in a reaction solution, which comprises:

(a) providing a plurality of micro-beads;

(b) attaching the biomolecules onto the micro-beads;

25 (c) placing the micro-beads with the biomolecules attached thereon

in the reaction solution; and

(d) placing the reaction solution into a plurality of micro-wells of a substrate, wherein the substrate is vibrated by a vibrating module to make the biomolecules attached on the micro-beads react evenly.

5 18. The method according to Claim 17, wherein the biomolecules are selected from the group consisting of nucleic acids, peptides and carbohydrates.

10 19. The method according to Claim 17, wherein the bioreaction is selected from the group consisting of polymerase chain reaction, nucleic acid-nucleic acid hybridization, protein-protein hybridization, and nucleic acid-protein hybridization.

 20. The method according to Claim 17, wherein the substrate is made from silicon.

15 21. The method according to Claim 17, wherein the micro-beads in step (a) are magnetic beads.

 22. The method according to Claim 17, wherein the micro-beads in step (b) are activated with a coupling agent for the biomolecules immobilized thereon.

20 23. The method according to Claim 22, wherein the coupling agent is 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide hydrochloride.

 24. The method according to Claim 17, wherein the vibrating module is set under the substrate.

 25. The method according to Claim 17, wherein the vibrating module comprises an electro-static vibrator.

25 26. The method according to Claim 17, wherein the temperature of the substrate is controlled by a temperature control module for

controlling the temperature of the reaction solution in the micro-wells.

27. The method according to Claim 26, wherein the temperature control module comprises a temperature sensor, a heater, and a cooler.

5 28. The method according to Claim 17, wherein the temperature sensor and the heater are a heating/sensing resistor.

29. The method according to Claim 17 further comprising activating the reaction solution with a laser source.

30. The method according to Claim 29 further comprising adjusting the laser source with a lens.

10 31. The method according to Claim 17 further comprising applying a cover plate during the bioreaction.

32. The method according to Claim 17 further comprising monitoring the bioreaction with a signal sensor.